

Appl. No. 10/803,192
Amdt dated August 8, 2006
Reply to Office Action of May 17, 2006

Attr. Ref. 81754.0111
Customer No. 26021

Remarks/Arguments

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Reconsideration of this application is requested.

Claim Status

Claims 1-20 are pending. Claims 1-3, 9-13, 19 and 20, which are withdrawn as a result of the previous restriction of invention and species requirements, are canceled without prejudice. Claims 5, 6, 14, 15 and 17 are also canceled without prejudice. Claims 4, 16 and 18 are amended. Claims 4, 7, 8, 16 and 18 are now pending.

Claim Rejections - 35 USC 102

Claims 4-8 and 14-18 are rejected under 35 USC 102(b) as anticipated by Hashimoto (US 6,323,542). In response, independent claim 4 is amended to clearly distinguish over Hashimoto.

The invention is directed to a semiconductor device wherein a first resin layer 26 is disposed on a substrate 12. Resin layer 26 comprises an inclined side face 28, a ridged edge 32 and a top face 30. Wiring 40 is disposed over the first resin layer 26, extending over ridged edge 32, and is electrically connected to a bond pad 16 on substrate 12. An external connection terminal 44 is disposed over and in electrical contact with wiring 40, and a part of terminal 44 is disposed over ridged edge 32. See, e.g., FIG. 4. The advantage of this configuration is that, since the surface area of ridged edges 32 is wider than the projected area of ridged edges 32, there is a greater amount of area for forming terminals 44 and wirings 40 (specification, paragraph 0041).

Hashimoto discloses various configurations of a semiconductor device wherein a resin layer is disposed on a substrate, wiring is disposed over the resin layer and is electrically connected to a bond pad on the substrate, and an electrical connection terminal is disposed over and in contact with the wiring. A typical configuration is shown in FIG. 2, wherein a connection terminal comprising a chromium layer 42, a copper layer 44, a base 46 and a solder ball 40 are disposed in

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a hole 36a in a resin (stress-relieving) layer 36. Chromium layer 42 is in electrical contact with wiring 38, which extends underneath resin layer 36 to an electrode 34.

The Action apparently interprets the junction between the flat top of resin layer 36 and the inclined hole portion 36a of resin layer 36 to be a "ridged edge", and also apparently interprets layers 42 and 44 to be part of the "wiring". Such a broad interpretation is the only way to support the contention that Hashimoto discloses wiring extending over the ridged edge in combination with a part of the connection terminal disposed above the ridged edge.

In applicant's invention, however, both the wiring and a part of the external terminal are disposed above the ridged edge of the resin layer, and the wiring disposed over the ridged edge extends as a unitary component to the bond pad. Independent claim 4 is amended as follows to emphasize this distinguishing feature:

...wirings, each being disposed over and electrically connected to a corresponding bonding pad and extending integrally over the first resin layer and over a corresponding ridged edge of the first resin layer; and

external connection terminals, each being disposed on a corresponding wiring and being electrically connected to the corresponding wiring, and a part of each external connection terminal being disposed above and in vertical alignment with the corresponding ridged edge that the corresponding wiring extends over

Hashimoto does not disclose such a configuration. For example, with respect to Hashimoto's FIG. 2, wiring 38 does not meet the claim recitations, since it does not extend over a ridge of resin layer 36. Layers 42, 44 do not meet the claim recitations, since they are not a unitary component that extends over the ridge and contacts pad 34.

The other embodiments of Hashimoto are similarly deficient. In FIGS. 7-10, although wiring 58 extends over a "ridge" of resin layer 56 in the region of bonding

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pad 174, this ridge is not the same ridge that connection terminal 60 is disposed over, as is required by the claims. FIG. 15 discloses a ridge (element 182) that wiring 180 extends over, however, terminal 174 is not also at least partially positioned over the ridge, as required by the claims. No other figure of Hashimoto discloses a terminal positioned over a ridge in a resin layer, and a wiring also positioned over that same ridge and extending integrally to a bonding pad on the substrate, as is required by applicant's claims.

Since Hashimoto does not disclose each and every limitation of claim 4, it cannot anticipate claim 4 or claims 7, 8, 16 and 18 dependent thereon. Accordingly, the rejections of claims 4, 7, 8, 16 and 18 under 35 USC 102(b) should be withdrawn.


Claims 5, 6 and 14 are canceled, without prejudice, since they are now incorporated into claim 4. Claims 15 and 17 are canceled, without prejudice, since they are duplicative of claims 7 and 8. Accordingly, the rejections of claims 5, 6, 14, 15 and 17 under 35 USC 102(b) are now moot and should be withdrawn.

Conclusion

This application is now believed to be in condition for allowance. The Examiner is invited to telephone the undersigned to resolve any issues that remain after entry of this amendment. Any fees due with this response may be charged to our Deposit Account No. 50-1314.

Respectfully submitted,
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